



BF620-Q

NPN high-voltage transistor

23 June 2023

Product data sheet

1. General description

NPN high-voltage transistor in a SOT89 (SC-62) flat lead Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- Low current (max. 50 mA)
- High voltage (max. 300 V)
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Video output stages

4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	300	V
I_C	collector current		-	-	50	mA
h_{FE}	DC current gain	$V_{CE} = 20\text{ V}$; $I_C = 25\text{ mA}$; $T_{amb} = 25\text{ }^\circ\text{C}$	50	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	E	emitter	<p>SOT89</p>	<p>sym042</p>
2	C	collector		
3	B	base		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BF620-Q	SOT89	plastic, surface-mounted package; 3 leads; 1.5 mm pitch; 4.5 mm x 2.5 mm x 1.5 mm body	SOT89

7. Marking

Table 4. Marking codes

Type number	Marking code
BF620-Q	DC

8. Limiting values

Table 5. Limiting values

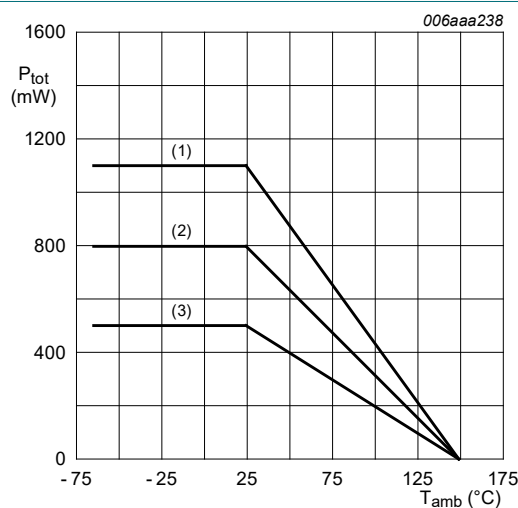
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit	
V_{CBO}	collector-base voltage	open emitter	-	300	V	
V_{CEO}	collector-emitter voltage	open base	-	300	V	
V_{EBO}	emitter-base voltage	open collector	-	5	V	
I_C	collector current		-	50	mA	
I_{CM}	peak collector current	single pulse; $t_p \leq 1$ ms	-	100	mA	
I_{BM}	peak base current		-	50	mA	
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	0.5	W
			[2]	-	0.8	W
			[3]	-	1.1	W
T_j	junction temperature		-	150	°C	
T_{amb}	ambient temperature		-65	150	°C	
T_{stg}	storage temperature		-65	150	°C	

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm².

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm².



(1) FR4 PCB; 6 cm² mounting pad for collector.

(2) FR4 PCB; 1 cm² mounting pad for collector.

(3) FR4 PCB; standard footprint.

Fig. 1. Power derating curves

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	250	K/W
			[2]	-	-	156	K/W
			[3]	-	-	113	K/W
$R_{th(j-sp)}$	thermal resistance from junction to solder point		-	-	30	K/W	

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 1 cm².

[3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and mounting pad for collector 6 cm².

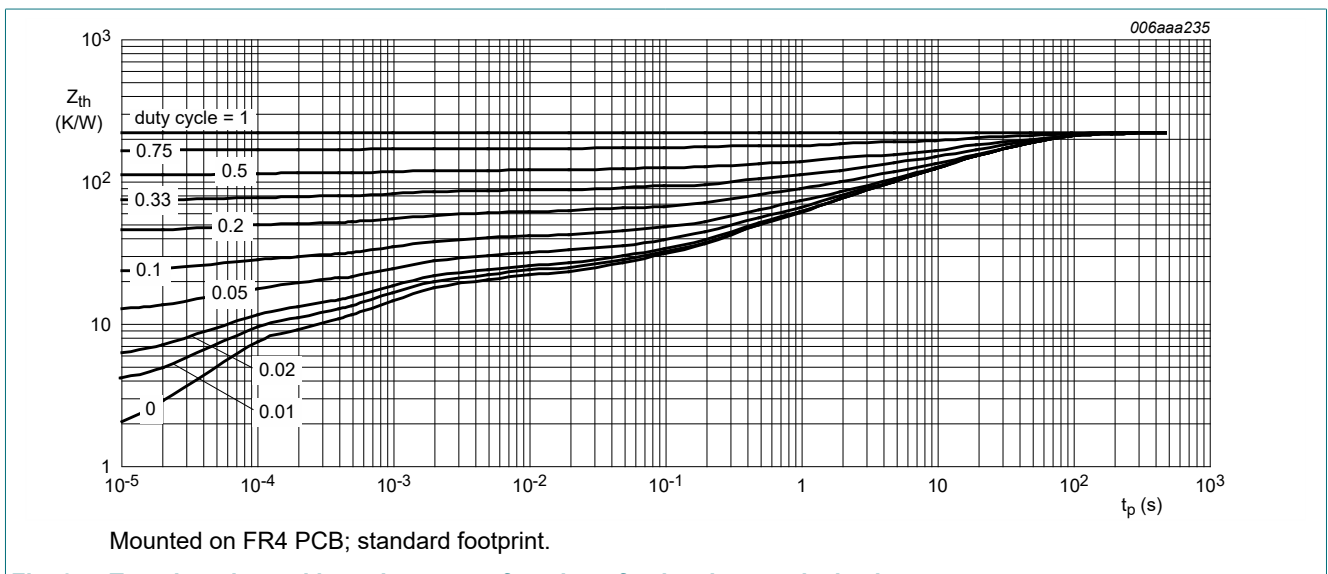


Fig. 2. Transient thermal impedance as a function of pulse time; typical values

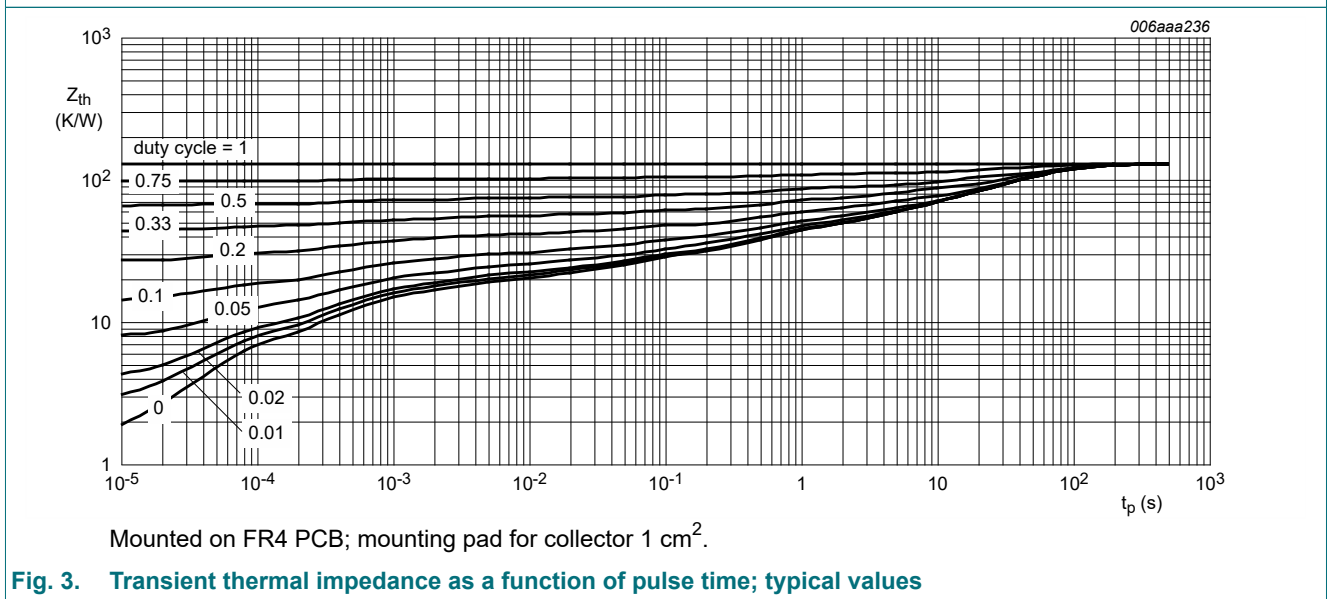
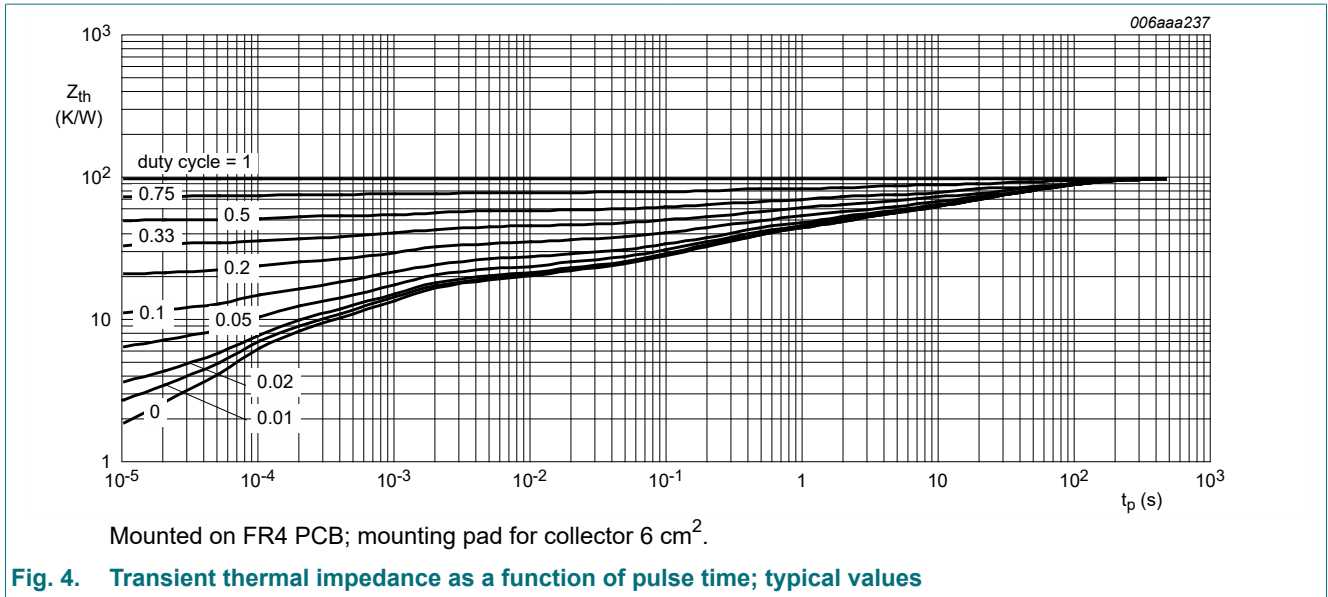


Fig. 3. Transient thermal impedance as a function of pulse time; typical values



10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
I _{CBO}	collector-base cut-off current	V _{CB} = 200 V; I _E = 0 A; T _{amb} = 25 °C	-	-	10	nA
		V _{CB} = 200 V; I _E = 0 A; T _j = 150 °C	-	-	10	μA
I _{EBO}	emitter-base cut-off current	V _{EB} = 5 V; I _C = 0 A; T _{amb} = 25 °C	-	-	50	nA
h _{FE}	DC current gain	V _{CE} = 20 V; I _C = 25 mA; T _{amb} = 25 °C	50	-	-	
V _{CEsat}	collector-emitter saturation voltage	I _C = 30 mA; I _B = 5 mA; T _{amb} = 25 °C	-	-	600	mV
C _{re}	feedback capacitance	i _c = 0 A; V _{CB} = 30 V; f = 1 MHz; I _C = 0 A; T _{amb} = 25 °C	-	-	1.6	pF
f _T	transition frequency	V _{CE} = 10 V; I _C = -10 mA; f = 100 MHz; T _{amb} = 25 °C	60	-	-	MHz

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

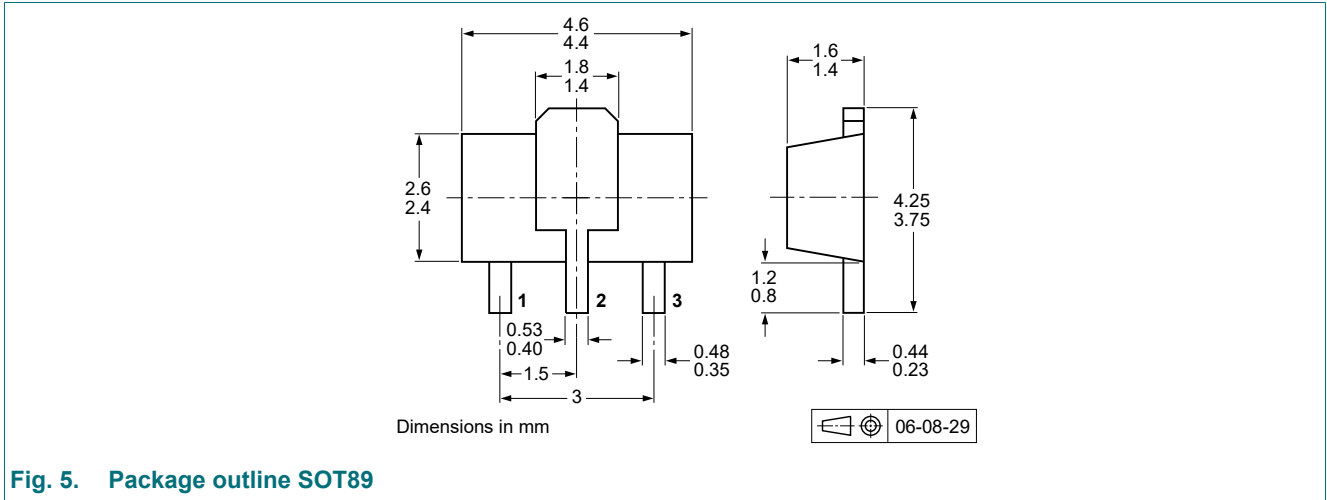


Fig. 5. Package outline SOT89

13. Soldering

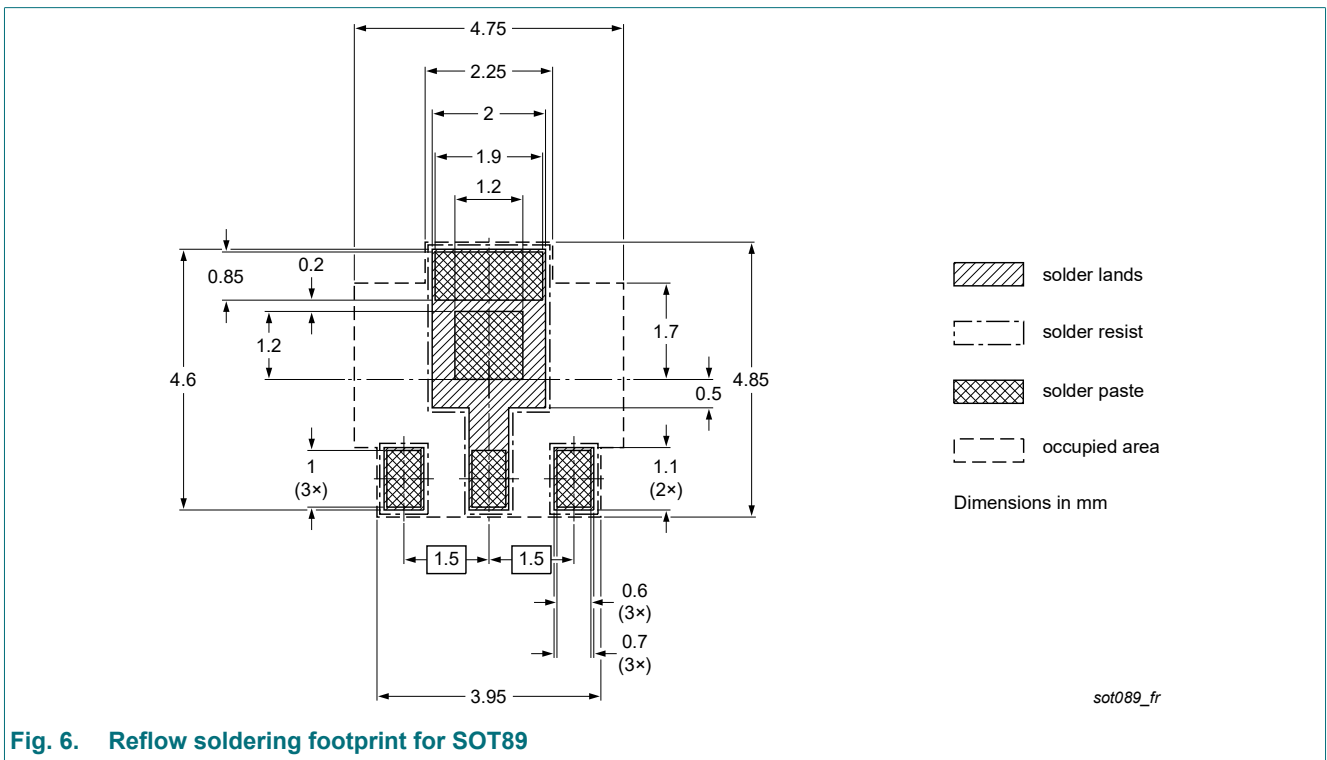


Fig. 6. Reflow soldering footprint for SOT89

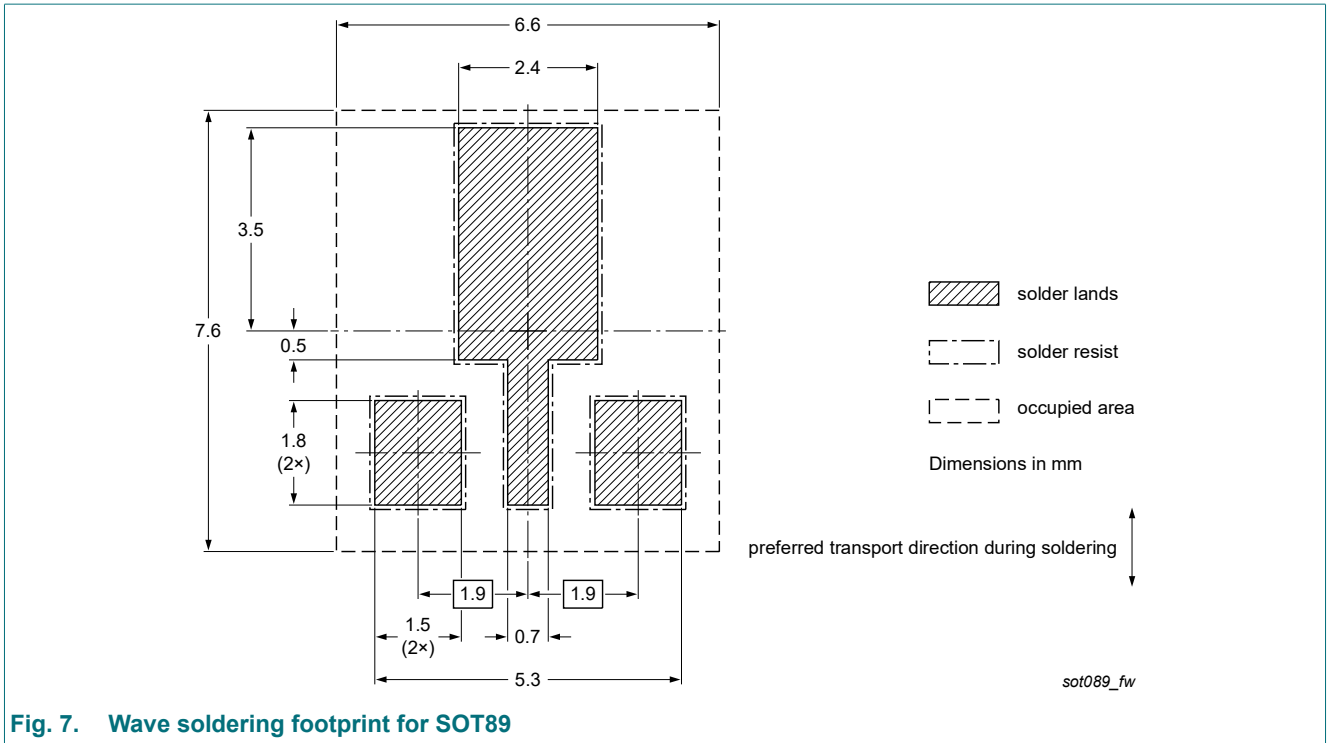


Fig. 7. Wave soldering footprint for SOT89

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BF620-Q v.1	20230623	Product data sheet	-	-

15. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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